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CDC Surveillance Summaries

Contents

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Foreword

The purpose of the *CDC Surveillance Summaries* is to make available the most current information on conditions of public health interest for which CDC has major responsibility. The *CDC Surveillance Summaries* are published quarterly and provide detailed analysis of the most current available data obtained for CDC surveillance programs. These reports complement other data published by CDC in the *Morbidity and Mortality Weekly Report (MMWR)*, the *MMWR Annual Summary*, and various disease-surveillance reports. This volume contains epidemiologic information derived from surveillance forms, special investigations, and other sources of information collected at the state and national levels.

History of CDC Surveillance Activities

CDC has been actively involved in disease-surveillance activities since the formation of the Communicable Disease Center in 1946. The original scope of the National Surveillance Program included the study of malaria, murine typhus, smallpox, psittacosis, diphtheria, leprosy, and sylvatic plague. In 1954, a surveillance section was established within the Epidemiology Branch of CDC, primarily concerned with planning and conducting continuing surveillance and making periodic reports. National emergencies such as the Asian influenza pandemic and the discovery of Legionnaires' disease have prompted the involvement of CDC in new surveillance activities. Over the years the surveillance activities of CDC have expanded to include not only new areas in infectious disease but also programs in human reproduction, environmental health, chronic disease, risk reduction, and occupational safety and health. Ongoing evaluation of these programs has led to new methods of data collection and analysis and has prompted examination of how data are disseminated to the public health community.

In 1980 and 1981, a survey of CDC staff and state epidemiologists suggested that improved coordination of surveillance reports with the *MMWR* and the *MMWR Annual Summary* would facilitate timely publication; provide greater uniformity in the acquisition, evaluation, and reporting of surveillance data; and encourage use of these data. Several approaches to the development of a systematic process of disseminating disease-specific surveillance reports were considered. On the basis of considerations of timeliness, cost advantages, and editorial uniformity, a report published on a quarterly basis was recommended.

The *CDC Surveillance Summaries* contain information more reflective of the detailed surveillance reports of the past. CDC hopes that the *Surveillance Summaries* will disseminate surveillance data on a regular schedule, improve the clarity of community public health information, and also realize a cost savings. Although the *CDC Surveillance Summaries* are published quarterly, they will not be limited to quarterly data; annual data will probably be more typical. The *MMWR Annual Summary* will complement rather than serve as the cumulative summary of the quarterly publications.

Data Sources

Data on the reported occurrence of notifiable diseases are derived from reports supplied by the state and territorial departments of health and CDC program activities, routinely published in the *MMWR*, and compiled in final form in the *MMWR Annual Summary*.

CDC also maintains national surveillance programs for selected diseases with the cooperation of state and local health departments as well as other federal agencies, and publishes detailed epidemiologic analyses periodically. Data appearing in the *CDC Surveillance Summaries* or in a surveillance report may not agree exactly with reports published in the *MMWR* because of differences in timing of reports or because of refinements in case definition. It should be noted that data collected for the *MMWR* and the more detailed data published by individual CDC programs are collected independently.

These data should be interpreted with caution. Some diseases that cause severe clinical illness and are associated with serious consequences are probably reported quite accurately. However, diseases that are clinically mild and infrequently associated with serious consequences are less likely to be reported. Additionally, subclinical cases are seldom detected except in the course of epidemic investigations or special studies. The degree of completeness of reporting is also influenced by the diagnostic facilities available, the control measures in effect, and the interests and priorities of state and local officials responsible for disease control and surveillance. Finally, factors such as the introduction of new diagnostic tests and the discovery of new disease entities may cause changes in disease reporting independent of the true incidence of disease. Despite these limitations the data in these reports have proven to be useful in the analysis of trends.

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Surveillance Programs
Centers for Disease Control

Surveillance program	Responsible branch	Most recent report/summary*
Abortion	Pregnancy Epidemiology Branch Division of Reproductive Health Center for Health Promotion and Education	SS 33/3 (1981 data)
Behavioral risk factors	Division of Nutrition Center for Health Promotion and Education	SS 33/1 (data from 1981-1983)
Berylliosis cohorts: registry of disease and exposure	Surveillance Branch Division of Surveillance, Hazard Evaluations, and Field Studies National Inst. for Occup. Safety & Hlth.	March 1983 (data from 1951-1980)
Biologics	Data Management Branch Division of Immunization Center for Prevention Services	Dec 1982 (1982 data)
Botulism	Enteric Diseases Branch Division of Bacterial Diseases Center for Infectious Diseases	May 1979 (data from 1899-1977)
Brucellosis	Bacterial Zoonoses Activity Division of Bacterial Diseases Center for Infectious Diseases	June 1979 (1978 data)
Coal workers' pneumoconiosis	Epidemiological Investigations Branch Division of Respiratory Disease Studies National Inst. for Occup. Safety & Hlth.	Feb 1983 (SS 32/1) (data from 1978-1980)
Congenital malformations	Birth Defects Branch Chronic Diseases Division Center for Environmental Health	Feb 1983 (SS 32/1) (data from 1970-1980)
Dengue	Dengue Branch Division of Vector-Borne Viral Diseases Center for Infectious Diseases	SS 33/1 (1982 data)
Diabetes	Division of Diabetes Control Center for Prevention Services	June 1979 (1978 data)
Diphtheria	Surveillance, Investigations and Research Branch Division of Immunization Center for Prevention Services	July 1978 (data from 1971-1975)
Ectopic pregnancy	Pregnancy Epidemiology Branch Division of Reproductive Health Center for Health Promotion and Education	SS 33/2 (data from 1979-1980)

*Publications denoted by "SS" appeared in issues of *CDC Surveillance Summaries*. Other reports listed can be obtained by contacting the responsible branch listed.

Surveillance Programs
Centers for Disease Control

Surveillance program	Responsible branch	Most recent report/summary*
Encephalitis	Arbovirus Reference Branch Division of Vector-Borne Viral Diseases Center for Infectious Diseases	May 1981 (1978 data)
Enterovirus	Respiratory and Enterovirus Branch Division of Viral Diseases Center for Infectious Diseases	Nov 1981 (data from 1970-1979)
Fifteen leading causes of death in the U.S., 1978	Health Analysis and Planning for Preventive Services Center for Prevention Services	Sept 1982 (1978 data)
Food-borne disease	Enteric Diseases Branch Division of Bacterial Diseases Center for Infectious Diseases	June 1983 (1981 data)
Hepatitis	Hepatitis Branch Division of Viral Diseases Center for Infectious Diseases	May 1983 (SS 32/2) (1981 data)
Homicide	Violence Epidemiology Branch Office of the Director Center for Health Promotion and Education	May 1983 (SS 32/2) (data from 1970-1978)
Hysterectomy	Epidemiologic Studies Branch Division of Reproductive Health Center for Health Promotion and Education	Aug 1983 (SS 32/3) (data from 1979-1980)
Influenza	Influenza Branch Division of Viral Diseases Center for Infectious Diseases	July 1984 (data from 1983-1984)
Lead poisoning in workers	Surveillance Branch Division of Surveillance, Hazard Evaluations, and Field Studies National Inst. for Occup. Safety & Hlth.	April 1983 (data from 1976-1980)
Leprosy	Respiratory and Special Pathogens Branch Division of Bacterial Diseases Center for Infectious Diseases	April 1976 (data from 1971-1973)
Leptospirosis	Bacterial Zoonoses Activity Division of Bacterial Diseases Center for Infectious Diseases	Aug 1979 (1978 data)
Malaria	Malaria Branch Division of Parasitic Diseases Center for Infectious Diseases	Oct 1984 (1983 data)

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Surveillance Programs
Centers for Disease Control

Surveillance program	Responsible branch	Most recent report/summary*
Maternal mortality	Division of Reproductive Health Center for Health Promotion and Education	SS 33/1 (data from 1974-1978)
Measles	Surveillance, Investigations and Research Branch Division of Immunization Center for Prevention Services	Sept 1982 (data from 1977-1981)
Mumps	Surveillance, Investigations and Research Branch Division of Immunization Center for Prevention Services	July 1978 (data from 1974-1976)
National electronic injury surveillance system	Safety Surveillance Branch Division of Safety Research National Inst. for Occup. Safety & Hlth.	May 1983 (SS 32/2) (1982 data)
National Occupational Hazard Survey (NOHS)	Surveillance Branch Division of Surveillance, Hazard Evaluations, and Field Studies National Inst. for Occup. Safety & Hlth.	NIOSH Technical Report DHHS (NIOSH) Pub. No. 83-117
Nosocomial infections	National Nosocomial Infections Study Hospital Infections Program Center for Infectious Diseases	SS 33/2 (1983 data)
Nutrition	Division of Nutrition Center for Health Promotion and Education	Nov 1982 (1980 data)
Occupational characteristics of disabled workers	Surveillance Branch Division of Surveillance, Hazard Evaluations, and Field Studies National Inst. for Occup. Safety & Hlth.	July 1980 (data from 1969-1972)
Occupational injuries among loggers	Safety Surveillance Branch Division of Safety Research National Inst. for Occup. Safety & Hlth.	Aug 1983 (SS 32/3) (data from 1969-1974)
Occupational mortality in working for State	Surveillance Branch Division of Surveillance, Hazard Evaluations, and Field Studies National Inst. for Occup. Safety & Hlth.	DHHS (NIOSH) Pub. No. 83-116 (data from 1950-1979)
Pediatric nutrition	Division of Nutrition Center for Health Promotion and Education	SS 32/4 (1982 data)
Pelvic inflammatory disease	Division of Sexually Transmitted Disease Center for Prevention Services	SS 32/4 (data from 1965-1982)

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Surveillance Programs
Centers for Disease Control

Surveillance program	Responsible branch	Most recent report/summary*
Plague	Plague Branch Division of Vector-Borne Viral Diseases Center for Infectious Diseases	SS 33/1 (1983 data)
Poliomyelitis	Surveillance, Investigations and Research Branch Division of Immunization Center for Prevention Services	Dec 1982 (data from 1980-1981)
Psittacosis	Bacterial Zoonoses Activity Division of Bacterial Diseases Center for Infectious Diseases	Feb 1983 (SS 32/1) (1979 data)
Rabies	Viral and Rickettsial Zoonoses Branch Division of Viral Diseases Center for Infectious Diseases	Feb 1983 (SS 32/1) (1981 data)
Reye syndrome	Epidemiology Office Division of Viral Diseases Center for Infectious Diseases	SS 33/3 (1983 data)
Rickettsial disease (RMSF, murine typhus, Q fever, endemic typhus)	Viral and Rickettsial Zoonoses Branch Division of Viral Diseases Center for Infectious Diseases	May 1981 (1979 data)
Rocky Mountain spotted fever	Viral and Rickettsial Zoonoses Branch Division of Viral Diseases Center for Infectious Diseases	SS 33/3 (data from 1981-1983)
Rubella	Surveillance, Investigations and Research Branch Division of Immunization Center for Prevention Services	May 1980 (data from 1976-1978)
Salmonella	Enteric Diseases Branch Division of Bacterial Diseases Center for Infectious Diseases	Dec 1982 (1980 data)
Sentinel health event (occupational) (SHE)	Surveillance Branch Division of Surveillance, Hazard Evaluations, and Field Studies National Inst. for Occup. Safety & Hlth.	Sept 1983
Summer mortality	Special Studies Branch Chronic Diseases Division Center for Environmental Health	Feb 1983 (SS 32/1) (data from 1979-1981)

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Surveillance Programs
Centers for Disease Control

Surveillance program	Responsible branch	Most recent report/summary*
Surgical sterilization	Epidemiologic Studies Branch Division of Reproductive Health Center for Health Promotion and Education	Aug 1983 (SS 32/3) (data from 1979-1980)
Toxic-shock syndrome	Respiratory and Special Pathogens Branch Division of Bacterial Diseases Center for Infectious Diseases	SS 33/3 (data from 1960-1984)
Trichinosis	Helminthic Diseases Branch Division of Parasitic Diseases Center for Infectious Diseases	SS 33/2 (1982 data)
Tuberculosis	Division of Tuberculosis Control Center for Prevention Services	Sept 1982 (1981 data) TB Statistics: States & Cities Nov 1983 (1980 data) TB in the United States
U.S. immunization survey	Surveillance, Investigations and Research Branch Division of Immunization Center for Prevention Services	April 1983 (data from 1979-1982)
Venereal disease	Division of Sexually Transmitted Disease Center for Prevention Services	(1980 data) Sexually Transmitted Diseases Statistical Letter-No. 130 (data from 1978-1979) STD Fact Sheet-Edition 35
Water-related disease outbreaks	Enteric Diseases Branch Division of Bacterial Diseases Center for Infectious Diseases	Sept 1984 (1983 data)

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Abortion Surveillance, 1981

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Introduction

In 1969, the Division of Reproductive Health initiated ongoing epidemiologic surveillance of abortion in the United States. The objectives of this surveillance are twofold: 1) to document the numbers and characteristics of women obtaining abortion and 2) to assist in efforts to eliminate preventable morbidity and mortality associated with abortion. This report contains abortion data reported to CDC for 1981.

Materials and Methods

CDC receives abortion statistics by state of occurrence for 50 states and the District of Columbia. Most of the data are obtained from state health agencies. Hospitals and/or medical facilities provided data from four states, and in Alaska and Kentucky, data were provided by The Alan Guttmacher Institute. Most states now provide both total number of abortions and demographic characteristics of abortion recipients.

CDC began surveillance of abortion-related deaths in 1972, utilizing several complementary sources. About two-thirds of the deaths are reported by state health departments. Other sources have included medical and hospital associations, maternal mortality committees, the National Center for Health Statistics, the Commission on Professional and Hospital Activities, case histories published in journals, and private sources. All deaths are investigated to determine type of abortion, cause of death, and possible preventable factors.

Results

For 1981, the 50 states and the District of Columbia reported 1,300,760 abortions, which represents less than a 1% increase over the number reported for 1980 (Table 1, Figure 1). The national abortion rate decreased from 25 abortions/1,000 women ages 15 to 44 in 1980 to 24/1,000 in 1981. A slight decrease also was noted in the abortion ratio, i.e., from 359 abortions/1,000 live births in 1980 to 358/1,000 in 1981 (Figure 2).

As in previous years, California and New York reported the highest numbers of abortions (Table 2); 28% of all abortions performed in the United States were reported in these two states. Alaska, South Dakota, and Wyoming each reported $< 2{,}000$ abortions in 1981. The highest abortion ratios were reported in the District of Columbia and New York City; the lowest were reported in Utah, West Virginia, and Wyoming. The abortion rate ranged from a low of 6 in West Virginia and Wyoming to nearly 160 in the District of Columbia.

Ninety-two percent of women obtaining an abortion had the procedure done in their state of residence. This is similar to the percentage reported in previous years. The states with the highest percentages of women having abortion out-of-state were Wyoming (62%), West Virginia (51%), and South Dakota (37%). In contrast, $\leq$ 1% of the women in California, Colorado, Florida, Hawaii, Michigan, and New York obtained out-of-state abortions.

TABLE 1. Characteristics of women obtaining abortions, United States, 1972

Characteristics	1972	1973	1974	1975	1976	Percentage 1,
Reported number of legal abortions	586,760	615,831	763,476	854,853	988,267	
Residence						
Abortion in-state	56.2	74.8	86.6	89.2	90.0	
Abortion out-of-state	43.8	25.2	13.4	10.8	10.0	
Age (years)						
≤ 19	32.6	32.7	32.7	33.1	32.1	
20-24	32.5	32.0	31.8	31.9	33.3	
≥ 25	34.9	35.3	35.6	35.0	34.6	
Race						
White	77.0	72.5	69.7	67.8	66.6	
Black and other	23.0	27.5	30.3	32.2	33.4	
Marital status						
Married	29.7	27.4	27.4	26.1	24.6	
Unmarried	70.3	72.6	72.6	73.9	75.4	
Number of live births†						
0	49.4	48.6	47.8	47.1	47.7	
1	18.2	18.8	19.6	20.2	20.7	
2	13.3	14.2	14.8	15.5	15.4	
3	8.7	8.7	8.7	8.7	8.3	
≥4	10.4	9.7	9.0	8.6	7.9	

1972-1981

ntage distribution*

1977	1978	1979	1980	1981
1,079,430	1,157,776	1,251,921	1,297,606	1,300,760
90.0	89.3	90.0	92.6	92.5
10.0	10.7	10.0	7.4	7.5
30.8	30.0	30.0	29.2	28.0
34.5	35.0	35.4	35.5	35.3
34.7	34.9	34.6	35.3	36.7
66.4	67.0	68.9	69.9	69.9
33.6	33.0	31.1	30.1	30.1
24.3	26.4	24.7	23.1	22.1
75.7	73.6	75.3	76.9	77.9
53.4	56.6	58.1	58.4	58.3
19.1	19.2	19.1	19.5	19.7
14.4	14.1	13.8	13.7	13.7
7.0	5.9	5.5	5.3	5.3
6.2	4.2	3.5	3.2	3.0

TABLE 1. Characteristics of women obtaining abortions, United States, 19

Characteristics	1972	1973	1974	1975	1976
					Percent
Type of procedure					
Curettage	88.6	88.4	89.7	90.9	92.8
Suction curettage	65.2	74.9	77.4	82.5	82.6
Sharp curettage	23.4	13.5	12.3	8.4	10.2
Intrauterine instillation	10.4	10.4	7.8	6.2	6.0
Hysterotomy/ hysterectomy	0.6	0.7	0.6	0.4	0.2
Other	0.5	0.6	1.9	2.4	0.9
Gestation (weeks)					
≤8	34.0	36.1	42.6	44.6	47.0
9-10	30.7	29.4	28.7	28.4	28.0
11-12	17.5	17.9	15.4	14.9	14.4
13-15	8.4	6.9	5.5	5.0	4.5
16-20	8.2	8.0	6.5	6.1	5.1
≥21	1.3	1.7	1.2	1.0	0.9

*Excludes unknowns. Since the number of states reporting each characteristic varies fr

†For years 1972-1977, data indicate number of living children.

es, 1972-1981 (cont.)

rcentage distribution*

'6	1977	1978	1979	1980	1981
8	93.8	94.6	95.0	95.5	96.1
6	90.8	90.2	91.3	89.8	90.4
2	3.0	4.4	3.7	5.7	5.7
0	5.4	3.9	3.3	3.1	2.8
2	0.2	0.1	0.1	0.1	0.1
9	0.7	1.4	1.6	1.3	1.0
0	51.2	52.2	52.1	51.7	51.2
0	27.2	26.9	27.0	26.2	26.8
4	13.1	12.3	12.5	12.2	12.1
5	3.4	4.0	4.2	5.2	5.2
1	4.3	3.7	3.4	3.9	3.7
9	0.9	0.9	0.9	0.9	1.0

ries from year to year, temporal comparisons should be made with caution.

FIGURE 1. Number of reported abortions and abortion rates, United States, 1969-1981

FIGURE 2. Number of reported abortions and abortion ratios, United States, 1969-1981

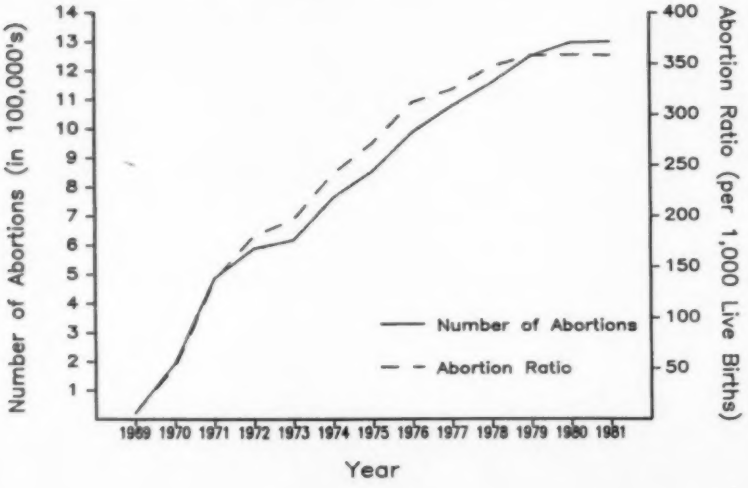

TABLE 2. Reported number of legal abortions and abortion ratios and rates, by state of occurrence, United States, 1981

State	Abortions*	Ratios†	Rates§
Alabama	13,485¶	219	15
Alaska	1,880**	186	18
Arizona	10,573	205	16
Arkansas	5,722	160	11
California	202,000	480	35
Colorado	17,240	331	23
Connecticut	18,565	414	23
Delaware	4,062	442	29
Dist. of Columbia	25,952	††	158
Florida	67,802	489	31
Georgia	31,894	355	24
Hawaii	6,692	368	29
Idaho	2,706	139	13
Illinois	68,290	369	25
Indiana	15,016	177	11
Iowa	6,288¶	137	9
Kansas	10,448	254	19
Kentucky	10,230**	179	12
Louisiana	18,237	222	18
Maine	3,277	198	13
Maryland	27,855	452	26
Massachusetts	40,913	553	30
Michigan	45,787	326	20
Minnesota	18,304	267	19
Mississippi	5,561	120	10
Missouri	18,604	242	16
Montana	3,838	268	21
Nebraska	5,753	212	17
Nevada	7,259	503	37
New Hampshire	3,757¶	278	17
New Jersey	29,254	304	17
New Mexico	5,194	196	17
New York	158,698	645	39
(City)	(101,880)§§	(939)	
(Upstate)	(56,818)	(414)	
North Carolina	32,050	383	23
North Dakota	2,554	206	18
Ohio	45,567	273	19
Oklahoma	10,327	193	16
Oregon	14,799	344	22
Pennsylvania	62,701	391	23
Rhode Island	7,515	605	36
South Carolina	12,496	241	15
South Dakota	1,579	124	10
Tennessee	21,911	327	21
Texas	85,755	305	25
Utah	3,842	93	11
Vermont	3,388	426	25
Virginia	32,037	404	25
Washington	30,978	444	30
West Virginia	2,640¶	95	6
Wisconsin	20,819	280	19
Wyoming	666	61	6
Total	1,300,760	358	24

*Abortion data from state health agency unless otherwise noted.

†Abortions/1,000 live births (live birth data from state health agency except for Alabama, Alaska, Delaware, Iowa, Kentucky, New Hampshire, West Virginia, and Wisconsin. Live birth data for these states from National Center for Health Statistics, *Monthly Vital Statistics Report*, Vol 32, No. 9, Supplemental, December 29, 1983).

§Abortions/1,000 females ages 15-44 (number of females ages 15-44 from Bureau of the Census, Current Population Survey, March 1981, Tape Technical Documentation, Washington: The Bureau, 1981).

¶Reported from hospitals and/or other medical facilities in state.

**Data from The Alan Guttmacher Institute.

††Greater than 1,000 abortions/1,000 live births.

§§Reported from New York City Health Department.

The percentage of the total abortions obtained by teenagers decreased from 29.2% in 1980 to 28.0% in 1981 (Table 1). This decrease was accompanied by an increase in the percentage of abortions obtained by women ≥ 25 years of age.

Females < 15 years of age continued to account for < 1% of abortions. As in previous years, the abortion ratios were highest at the extremes of the reproductive age spectrum. The highest ratios were for females < 15 years of age (1,393), those 15-19 years of age (716), and those ≥ 40 years of age (789). The ratios for the two younger groups are nearly identical to those previously reported for 1980, whereas the ratio for women ≥ 40 is lower than the 1980 level of 807.

About 70% of women obtaining an abortion in 1981 were white. The abortion ratio was higher for black and other races than for whites: 549 versus 329 abortions/1,000 live births. Compared with the ratios for 1980, these ratios represent a slight increase for black and other races and a slight decrease for whites.

Over three-fourths of the women obtaining an abortion in 1981 were not married. The abortion ratio for unmarried women was 1,452/1,000 live births, which is 14 times higher than the ratio of 102 for married women. A similar difference was observed in 1980.

Nearly 60% of women obtaining an abortion had had no previous live births; only 3% had had four or more live births. These values are similar to those observed in previous years.

Sixty-three percent of women obtaining an abortion in 1981 were having the procedure performed for the first time. Twenty-three percent had already had one abortion, 7% had had two and 3% had had three or more. In 1981, the percentage of women who had already had abortions performed before the reporting year was higher than in 1980 (33.3% versus 30.9%).

The percentage of women undergoing an abortion by instrumental evacuation (curettage, dilatation and evacuation [D&E]) has continued to increase, accounting for 96% of abortions in 1981. Suction curettage accounted for 94% of all curettage abortions. About 3% of all abortions are performed using instillation techniques, and less than 1% using hysterotomy or hysterectomy. Virtually all abortions done at ≤ 12 weeks' gestation are performed using curettage. The percentage of abortions being performed by D&E at 13-15 weeks' and 16-20 weeks' gestation has continued to rise, and D&E is now the most common method used at these gestational ages. However, the percentage of abortions done by D&E at ≥ 21 weeks' gestation dropped between 1980 and 1981 from 29.7% to 23.9%.

In 1981, as in previous years, more than half of the reported abortions were performed in the first 8 weeks of gestation, with 90% performed in the first 12 weeks. Younger women continued to obtain abortions at later gestational ages than did older women; 8% of women ≤ 19 years of age had abortions performed at gestational ages ≥ 16 weeks, compared with 4% of the women > 19 years of age. Women of black and other races were slightly more likely to obtain abortions in the second trimester than were white women (12.9% versus 10.6%).

Eleven women died as a result of abortion in 1981. Of the 11 deaths, three were associated with spontaneous abortion, one with illegal abortion, and seven with legal abortion. Deaths from spontaneous and legal abortion reflect the lowest numbers recorded since CDC began its abortion surveillance. The death-to-case rate for legal abortions was 0.5/100,000 abortions, whereas the rate in 1980 was 0.7.

Discussion

Since 1969, when CDC began collecting information on legal abortion, the total number of procedures has increased each year. The greatest increases were observed in the period 1969-1973 and could, at least in part, be attributed to an expanded surveillance system and

the legalization of abortion in an increasing number of states. In each year since 1976 (except 1979), the annual percentage increase in numbers of abortions has continued to decline. The 1981 increase is the lowest yet reported, and for the first time since surveillance was initiated, both the abortion rate and ratio declined.

The number of abortions reported to CDC was probably lower than the number actually performed in 1981. CDC data are based primarily on summary information provided by state health departments, and totals are usually lower than those obtained by direct surveys. The 1981 CDC total is 21% lower than that reported by The Alan Guttmacher Institute, which bases its data analysis on a nationwide survey of abortion providers (*1*). The differences between these two data sources may reflect some biases in the CDC data. Abortions performed in physicians' offices are probably done at earlier gestational ages than those done in clinics and hospitals and may be less likely to be reported to health agencies. Thus, there may be a bias of gestational age distributions toward the later stages of pregnancy.

Since 1975, the vast majority of women have obtained abortions in their state of residence. The 8% who continue to obtain abortion out-of-state may do so because of lack of facilities in their area of residence and/or the proximity of residence to a state boundary, with the nearest provider being in the adjoining state.

Because abortions are reported by state of occurrence and because information on state of residence is incomplete, abortion rates and ratios are calculated by place of occurrence. The abortion rate denominator is number of resident births. The resulting abortion rates and ratios therefore may not accurately reflect the frequency with which abortion is obtained by residents of those states.

The age distribution of women obtaining abortion has continued to shift from the ≤ 19-year-old group to the two older age groups, largely as a result of a similar demographic shift in the population (*2*). As in previous years, women at each end of the reproductive-age distribution had the highest abortion-to-live-birth ratio.

Women of black and other races accounted for 50% of abortions obtained by women <15 years of age. In contrast, in the older categories, almost 70% of abortions were obtained by whites. In part, the higher percentage of abortions among black females 10-14 years of age reflects the younger age at first intercourse for blacks than for whites (*3*). During 1981, the age-specific fertility rate for this age group was 8.2 times higher for blacks and others than for whites (*4*).

The percentage of women whose reported abortion was preceded by at least one other abortion has continued to rise. This increase probably reflects the growing number of women who have had previous abortions rather than reflecting any increased reliance on abortion as a primary method of birth control (*5*).

Curettage accounts for virtually all abortions performed at ≤ 12 weeks' gestation. D&E has continued to increase in popularity as a method of abortion for the periods 13-15 and 16-20 weeks' gestation, probably reflecting the method's lower cost and higher levels of safety and convenience relative to instillation methods (*6*).

The number of deaths associated with abortion has decreased steadily since 1972; the 11 deaths in 1981 are the lowest number yet recorded for a reporting year. During the 11-year period during which CDC has maintained mortality statistics, the number of illegal abortion deaths decreased the most (97%), whereas spontaneous abortion deaths decreased 88%, and legal abortion deaths decreased 71%.

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The National Reye Syndrome Surveillance System, 1983

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Introduction

Reye syndrome (RS) was first described as a clinical entity in 1963 by R.D.K. Reye and associates in Australia. RS typically follows (within 4-7 days) the onset of a common viral infection, most notably influenza or varicella, although other viruses have been implicated. Clinical symptoms typically include profuse vomiting and lethargy, progressing to disorientation, combativeness, and, in severe cases, deepening stages of coma. Children under one year of age, however, will frequently present with apnea, seizures, or coma, without any significant history of vomiting or delirium. In addition, laboratory tests reveal a hepatopathy with elevation of aminotransferase levels to at least 2-3 times normal, hyperammonemia, prolongation of the prothrombin time, and, in young children, hypoglycemia. Bilirubin levels are usually normal or only slightly elevated, and the cerebrospinal fluid reveals minimal or no cellular response. RS is a life-threatening condition, and in spite of many improvements in therapy, between 20% and 35% of patients with RS reported through national surveillance die during the acute illness. RS affects primarily the pediatric population, including teenagers, with over 90% of all reported cases being in children under 18 years of age.

The National Reye Syndrome Surveillance System (NRSSS) was initiated in late 1973 in an effort to monitor the incidence of this disease during an anticipated epidemic of influenza B, and during the winter of 1973-1974 the first nationwide outbreak of RS was described. In December 1976, prospective nationwide surveillance for RS was again intensified, and the NRSSS has been maintained continuously since that time. In this system, a surveillance year begins on December 1 and extends through November 30 of the following year. In 1974, the surveillance year extended only through June 30. This report describes the 198 cases reported during the 1983 surveillance year.

Materials and Methods

In 35 states, RS is a reportable disease by public law or administrative ruling. However, the completeness of reporting varies widely and depends, in large measure, upon awareness of the syndrome and upon interest in reporting on the part of both the medical and lay communities. Reporting of cases in the NRSSS involves the completion of a standardized case investigation form, which allows relatively uniform collection of data.

For epidemiologic purposes, a case of RS is defined by CDC as:

1. An acute noninflammatory encephalopathy documented by a) a clinical picture of an alteration in the level of consciousness, and, if available, b) a cerebrospinal fluid specimen containing $\leq$ 8 leukocytes/mm^3, or c) histologic sections of the brain demonstrating cerebral edema without perivascular or meningeal inflammation;

2. Evidence of hepatic involvement documented by either a) microvesicular fatty metamorphosis of the liver, diagnosed by biopsy or autopsy, or b) a three-fold or greater rise in either the serum glutamic-oxaloacetic transaminase (SGOT), serum glutamic-pyruvic transaminase (SGPT), or serum ammonia (NH_3), and, if available, c) a serum total bilirubin of < 4.0 mg/dl; and
3. No other more reasonable explanation for the cerebral and hepatic abnormalities.

A patient with a clinical history and laboratory abnormalities compatible with RS, but without any central nervous system symptoms, is classified as a stage 0 RS patient. Such patients do not meet the CDC case definition since the definition requires symptoms of encephalopathy, and they are not included in total case counts.

In addition to demographic, clinical, and laboratory information, physicians and hospital personnel reporting cases are asked to report the patient's neurologic condition, both on admission to the hospital and during the most severe phase of illness. For this purpose, the NRSSS uses a six-level staging system that includes:

Stage 0 alert wakefulness
Stage I difficult to arouse, lethargic, sleepy
Stage II delirious, combative, purposeful or semi-purposeful motor responses
Stage III unarousable, predominantly flexor motor responses, decorticate
Stage IV unarousable, predominantly extensor motor responses, decerebrate
Stage V unarousable, flaccid paralysis, areflexia, pupils unresponsive

A seventh category is defined as "curarized or equivalent; therefore could not classify."

Results

A total of 269 patients with onset of possible RS between December 1, 1982, and November 30, 1983, were reported to CDC. Of these 269 patients, 198 (74%) met CDC's case definition. Of the 71 patients who did not meet the CDC case definition, 20 were classified as stage 0 cases, 19 had no appropriate documentation of hepatopathy, 18 had a serum total bilirubin ≥ 4.0 mg/dl, 8 had no documentation of encephalopathy, and 6 had > 8 leukocytes/mm^3 in a CSF specimen.

Geographic distribution. The 198 cases were reported from 39 states, for an overall incidence of 0.32 cases/100,000 children < 18 years of age, the lowest incidence reported through the NRSSS since its inception (Table 1). Only four sparsely-populated states had reported incidences of > 1.0 case/100,000 children < 18 years of age (Table 2), and nine states had an annual reported incidence of 0.50-1.00.

Antecedent illness. Of the 194 patients with known information concerning antecedent illness, 183 (94%) reported having had some type of illness in the 2 weeks before onset of RS (defined as onset of severe vomiting or change in mental status). Of those 183 cases, 132 (72%) followed a respiratory illness; seven (4%), gastrointestinal illness; and 16 (9%), other types of illness, including fever or nonvaricella rash only. Only 28 cases (15%) reported a varicella prodrome, compared with 103 (19%) in 1980, 77 (26%) in 1981, and 45 (21%) in 1982. RS cases continued to peak during the influenza season, December through May, during the 1983 surveillance year (Figure 1).

Demographic characteristics. Most RS patients were school-age children: 53% of patients were 5-14 years of age, 37% were 0-4, 7% were 15-19, and 3% were ≥ 20. When patients are separated into 10-year age groups, the decline in reported cases from 1981 to 1983 is accounted for by a drop in the number of cases reported in children under 10 years of age (Table 3). Of the 193 patients with known race, 183 (95%) were white. Although only 8 (4%) of all patients were black, 4 (50%) of these were ≤ 1 year of age. Compared with 30 (16%) of 183 white patients, this represents a statistically significant difference (p=0.035, Fisher's exact test). Of the 197 patients with known sex, 103 (52%) were female.

TABLE 1. Reported incidence and case-fatality ratio of Reye syndrome, United States, 1974 and 1977-1983

Year	Predominant influenza strain	Number of cases	Incidence*	Deaths/ cases †	Case-fatality ratio (%)
1974	B	379	0.58	157/379	41
1977	B	454	0.71	156/373	42
1978	A(H3N2)	237	0.37	66/225	29
1979	A(H1N1)	389	0.62	113/349	32
1980	B	548	0.88	114/516	22
1981	A(H3N2/H1N1)	297	0.47	83/280	30
1982	B	213	0.34	70/200	35
1983	A(H3N2)	198	0.32	57/181	31

*Cases/100,000 population < 18 years of age.
†With known outcome.

TABLE 2. Reported cases* of Reye syndrome by state of residence, December 1, 1982 - November 30, 1983

State	Reported cases	Incidence†	State	Reported cases	Incidence†
Alabama	6	0.54	New Jersey	1	0.05
Arkansas	1	0.15	New Mexico	1	0.23
California	12	0.18	New York	13	0.29
Colorado	1	0.12	North Carolina	2	0.12
Florida	6	0.24	North Dakota	2	1.02
Georgia	2	0.12	Ohio	15	0.52
Hawaii	1	0.35	Oklahoma	13	1.42
Illinois	10	0.32	Oregon	4	0.56
Indiana	11	0.72	Pennsylvania	8	0.27
Iowa	3	0.38	Rhode Island	1	0.44
Kansas	2	0.31	South Dakota	4	1.96
Kentucky	4	0.38	Texas	26	0.56
Maine	4	1.30	Utah	4	0.66
Maryland	1	0.09	Vermont	1	0.71
Massachusetts	3	0.22	Virginia	4	0.28
Michigan	12	0.48	Washington	1	0.09
Minnesota	7	0.62	West Virginia	1	0.19
Missouri	4	0.30	Wisconsin	4	0.31
Nevada	1	0.44	Wyoming	1	0.63
New Hampshire	1	0.40			

*Includes only cases meeting CDC case definition.
†Cases/100,000 population < 18 years of age.

Clinical characteristics. Previous CDC reports revealed a tendency for patients in recent years to be admitted to hospitals at earlier stages of illness (*1*). In the 1983 surveillance year, however, a smaller proportion of patients were admitted in stage 0 or stage I encephalopathy (7% and 29%, respectively) (Figure 2).

Recurrent cases of RS and cases occurring among siblings are rare. In the 1983 surveillance year, there were no reported recurrent or sibling RS cases.

Outcome. The short-term outcome (as of the time of completion of case investigation reports) was reported for 181 of the 198 RS patients in the 1983 surveillance year. Fifty-seven died, for a case-fatality ratio of 31% (Table 1). Of the 124 surviving patients, 109 (88%) were reported to have recovered without sequelae, 12 (10%) had mild neurologic sequelae, and 3 (2%) had severe neurologic sequelae. Long-term monitoring of sequelae is not provided by the NRSSS.

FIGURE 1. Reye syndrome cases, by month of onset, United States, December 1, 1980-November 30, 1983

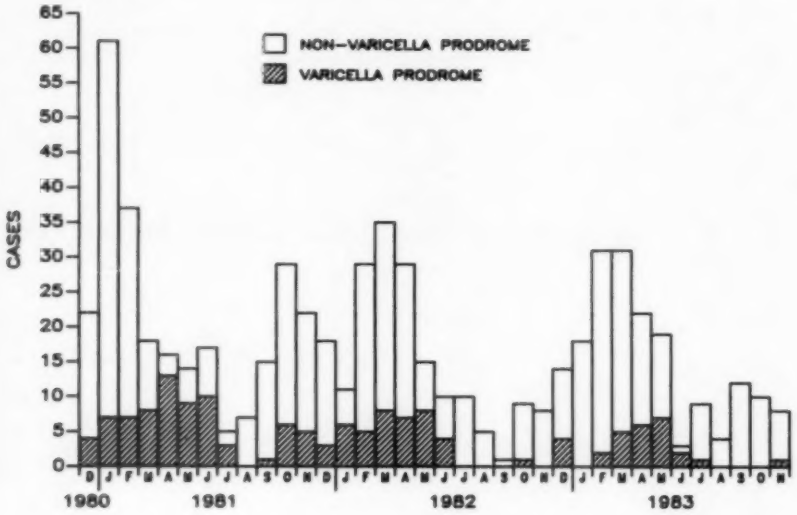

TABLE 3. Number of Reye syndrome cases, by 10-year age group,* United States, 1981-1983

Age group	Year 1981	1982	1983
0-9	206	143	117
10-19	74	65	75
> 19	2	1	5
Total	**282**	**209**	**197**

*For those cases with age known.

Discussion

The calculated incidence of RS during 1983 is among the lowest reported through the NRSSS since its initiation in December 1973. Whereas the NRSSS is useful in identifying such secular trends in RS activity, it undoubtedly underestimates the true incidence of this disease.

The overall occurrence of RS each year reflects, in part, the type and incidence of influenza activity. The predominant influenza virus isolate reported through the World Health Organization (WHO) influenza surveillance system during 1983 was influenza A (H3N2), a type which has not been previously associated with large outbreaks of RS. During the 2 previous surveillance years when influenza A (H3N2) activity predominated, the reported incidence of RS was comparably low: 0.37 and 0.47 cases/100,000 children < 18 years of age in 1978 and 1981, respectively, vs. 0.32 in 1983. The low number of varicella cases reported during 1983 appears to reflect the overall decreasing attack rate for children under 10 years of age. The small number of varicella-associated RS cases in children 10 years of age and older remained relatively stable between 1980 and 1983, consistent with the relatively stable annual varicella activity in the United States.

RS continues to be a devastating illness, with significant mortality in the pediatric age group. The NRSSS has proven to be a useful tool in the monitoring of trends in the epidemiology of RS.

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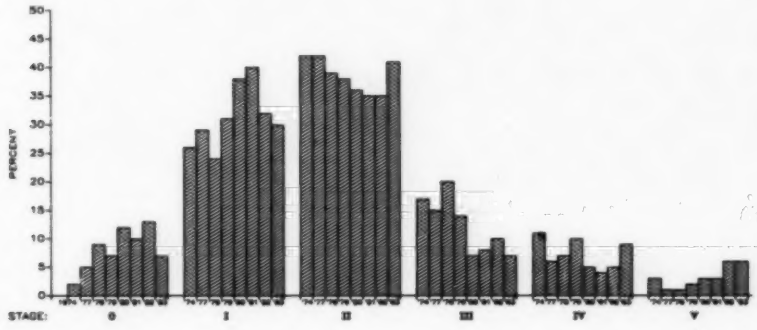
FIGURE 2. Distribution of Reye syndrome cases, by year and by patient's stage of coma on hospital admission, United States, 1974, and 1977-1983



Surveillance of Rocky Mountain Spotted Fever, United States, 1981-1983

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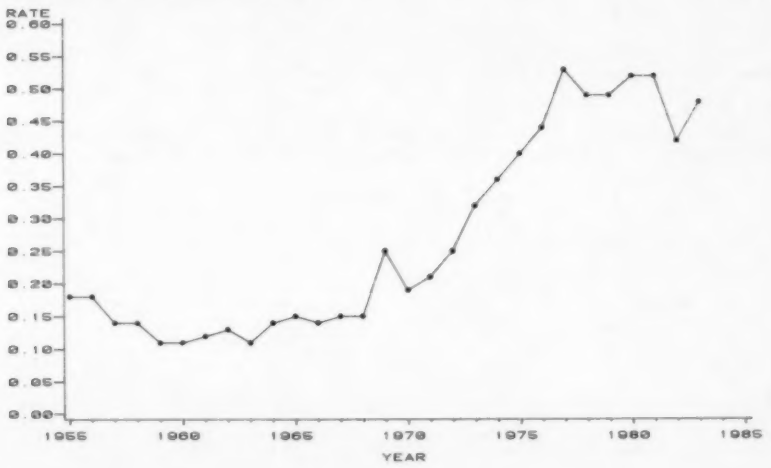
Introduction

Since 1920, CDC has collected from state health departments annual data on reported cases of Rocky Mountain spotted fever (RMSF). Previous reports have summarized and analyzed available data for 1920-1980 (*1-4*). A marked increase in the number of reported cases of RMSF in the 1970s peaked at 1,115 cases (0.53 cases/100,000 population) in 1977 (*2,3*).

In the period 1978-1980, the incidence of RMSF remained stable. The rate remained essentially unchanged from 1981-1983, with a median of 0.48 cases/100,000 population/year (range 0.42-0.52) (Figure 1). In 1981, an expanded case report form was introduced from which more precise epidemiologic, clinical, and laboratory information on RMSF could be obtained. This report form required more sensitive and specific diagnostic criteria to designate a case as being confirmed.

Cases of RMSF can be confirmed serologically by demonstration of a single complement fixation (CF) titer of $\geq$ 16 or a single indirect fluorescent antibody (IFA) titer of $\geq$ 64 or by

FIGURE 1. Reported cases of Rocky Mountain spotted fever per 100,000 population, by year, United States, 1955-1983



tests of paired serum specimens that demonstrate a fourfold rise in titer using CF, IFA, microagglutination (MA), latex agglutination (LA), or indirect hemagglutination (IHA) procedures. Isolation of rickettsiae or positive direct immunofluorescence of a skin biopsy or autopsy specimen also constitutes confirmation. Fourfold rises using the Weil-Felix assay (*Proteus* OX-19 or OX-2) or single LA, MA, or IHA titers of ≥ 128 provide evidence of probable cases. Cases fulfilling none of these criteria are classified as "not confirmed."

Case Reporting and Geographical Distribution of Cases

Surveillance activities. Cases of RMSF are reported to CDC in two ways: 1) in weekly reports filed by the state health departments and published in the Cases of Specified Notifiable Diseases section of the *MMWR* and 2) in case report forms summarizing clinical, epidemiologic, and laboratory data that are completed by state or local health departments or private physicians involved with a case. There is considerable overlap in reporting by the two methods; neither mechanism is thought to reflect accurately the true number of cases of RMSF occurring in the United States. Since more cases of RMSF are reported through the weekly reports, this method is considered the reference standard for data on the overall incidence of RMSF.

Table 1 summarizes the number of cases, and the average incidence in those states with average annual incidence of ≥ 1 case/100,000 (twice the national average) in the period 1981-1983. Only Maine and Vermont reported no RMSF cases in the 3-year period. The disease is reportable in all states except Alaska and Hawaii.

Results

Overall findings. Of the 3,294 cases reported to CDC in 1981-1983 (Table 2), case report forms were submitted for 2,850 (87%). This percentage is comparable with that for the 1978-1980 period, when case report forms were submitted for 89% of the cases. Of the 2,850 cases for which case report forms were received, 1,375 (48%) were laboratory confirmed, 284 (10%) were probable cases, and 1,191 (42%) were not confirmed. Both numbers and percentages of laboratory-confirmed cases have increased steadily since 1981, when the more stringent criteria for serologic testing were adopted. In 1981, 35% of cases were laboratory confirmed; in 1983, 63% were confirmed. Serologic data for 77% of the cases that were not confirmed were inadequate to establish or refute a diagnosis of RMSF.

TABLE 1. Cases of Rocky Mountain spotted fever, by year and by state with an average incidence of ≥ 1.0 cases per 100,000 population, United States, 1981-1983

State	Number of cases				Average incidence*
	1981	1982	1983	Total	
Oklahoma	99	77	221	397	4.10
North Carolina	301	227	208	736	4.08
South Carolina	102	106	80	288	2.97
Virginia	104	74	60	238	1.44
Arkansas	35	21	41	97	1.40
Tennessee	82	59	49	190	1.36
Georgia	76	54	68	198	1.17
Maryland	70	37	34	141	1.10
Montana	12	5	8	25	1.06

*Cases/100,000 population/year.

Age, sex, and temporal distribution of cases. From information obtained from case report forms in the period 1981-1983—and excluding those case report forms in which specific information was not available—92% of patients reported onset of symptoms between April 1 and August 31. Persons < 19 years of age accounted for 52% of the cases, with the highest incidence being for 5- to 9-year-old children (1.1 cases/100,000 population/year); this age group accounted for 19% of all reported cases. The incidence was higher for males (0.56 cases/100,000/year) than females (0.31 cases/100,000) and higher for whites (0.41 cases/100,000) than blacks (0.25 cases/100,000). The overall case-fatality ratio in 1981-1983 was 4.0%, compared with 4.5% and 5.2% in 1978-1980 and 1975-1978, respectively.

Symptoms and mortality data. Symptoms reported on the case report form included myalgia (98%); fever (97%); headache (89%); rash (86%); palmar rash (64%); and the triad of fever, headache, and rash (73%). As in previous periods, older persons more commonly had fatal cases, with a case-fatality ratio of 8.4% for persons ≥ 30 years of age (and 15.5% for persons ≥ 70), compared with 2.2% for persons < 30 ($p < 0.001$, Chi square test).

Patients who died were less likely to have reported a history of a tick bite within 14 days of onset of illness ($p < 0.05$) and less likely to have been treated with tetracycline or chloramphenicol ($p < 0.01$). There were no statistically significant differences between survivors and nonsurvivors when analyzed by sex; race; or the presence of fever, headache, rash, or myalgia. Restricting the analysis to serologically confirmed cases did not significantly change any of the above analyses.

Summary

The increase in the incidence of RMSF observed in the 1970s appears to have plateaued at a median of 0.49 cases/100,000 for the 6-year period 1978-1983. In 1981-1983, for the first time, Oklahoma had the highest incidence of RMSF in the United States (4.10 cases/100,000/year); increased numbers of cases were also reported from two of the other three West South Central states—Texas and Arkansas. Texas, which reported 217 cases in the 3-year period, had an average incidence of 0.47 cases/100,000/year.

This apparent regional increase in RMSF activity may reflect multiple factors, including increased recognition and reporting of cases and environmental factors that may be associated with a true increase in RMSF.

Simultaneously, a decrease in the number of cases reported and in the incidence of RMSF have been observed in the South Atlantic states, although these states still account for most (51%) of the cases in the United States. The slight decrease in the case-fatality ratio observed over the last 9 years is unexplained. It may reflect increased awareness of RMSF and result in appropriate and timely treatment.

The increasing number and percentage of cases that are laboratory confirmed suggest

TABLE 2. Reported cases of Rocky Mountain spotted fever, United States, 1981-1983

Year	Number of cases reported	Number of case report forms submitted (%)	Number of confirmed cases (% of case report forms)
1981	1,192	1,059 (91)	372 (35)
1982	976	834 (85)	400 (48)
1983	1,126	957 (85)	603 (63)
Total	**3,294**	**2,850 (87)**	**1,375 (48)**

that the more sensitive and specific laboratory tests now required for serologic confirmation are being more widely used and are contributing to an increased accuracy of reporting of RMSF in this country.

Early treatment of RMSF is facilitated by considering the diagnosis for any person who has a fever and has been in RMSF-endemic areas during the spring and summer months and by recognizing the often protean manifestations of the disease (*5*). Only through prompt clinical diagnosis and prompt treatment with tetracycline or chloramphenicol can the death rate be lowered.

Prevention of RMSF requires inspection for ticks after a likely exposure and removal of ticks by grasping with tweezers as closely as possible to the point of attachment and pulling slowly and steadily. No vaccine against RMSF is available.

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Epidemiology of Toxic-Shock Syndrome, United States, 1960-1984

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Introduction

Although toxic shock syndrome (TSS), a life-threatening multisystem illness caused by *Staphylococcus aureus*, was first described by Todd and co-workers in 1978 (*1*), it was not until early 1980 that it began to attract the attention of the scientific and medical community, the lay press, and the public. Since then, a tremendous amount has been learned about TSS, particularly its clinical and epidemiologic aspects, and substantial progress has been made at unravelling its pathogenesis. This review will be limited to the epidemiologic features of TSS, and it will focus primarily on data gathered in the United States.

Materials and Methods

The Centers for Disease Control (CDC) began collecting information on TSS cases in early 1980. Suspected cases of TSS have been reported via a number of mechanisms and by many types of individuals, including the patients themselves, physicians, lawyers, parents, and state and local health officials. Early on, a strict case definition was formulated by CDC physicians, in cooperation with Todd and others, in order to ensure that cases being included in various studies and surveillance systems were all, in fact, the same clinical entity. This case definition, which includes fever, hypotension, a characteristic rash with subsequent desquamation of the skin, evidence of multisystem involvement, and absence of evidence of another likely cause of the illness, is still used today with only minor modifications (*2*). While it is recognized that this case definition is very restrictive and that TSS undoubtedly occurs in milder forms, the absence of a sensitive and specific diagnostic test for TSS makes it necessary to apply such a restrictive case definition in current epidemiologic and clinical studies. Thus, while milder suspected cases in which criteria listed above were not fulfilled have been reported, only the cases meeting the strict case definition are included in this report.

Results

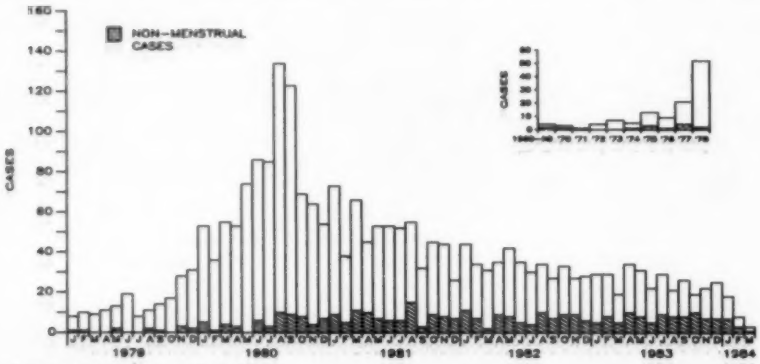
As of April 16, 1984, 2,509 cases of TSS had been reported to CDC from across the United States. TSS cases have been reported in all 50 states (Figure 1) and in many other countries, including most of the European countries, Japan, Australia, New Zealand, Israel, Canada, and South Africa. In the United States, the number of cases reported annually has dropped consistently since 1980 (Figure 2).

Of the 2,509 cases, 2,382 have had a known outcome; 110 (5%) were fatal. The case-fatality rate has dropped consistently over time, from 10% for cases with onset before 1980, to 5% in 1980, 3% in 1981, 2.5% in 1982, and 2.6% in 1983. It should be noted that the high case-fatality rate seen for cases with onset before 1980 almost certainly reflects the fact that all such cases were reported retrospectively and that fatal cases may be overrepresented.

Of the reported cases, 124 (5%) have been in males and 2,385 (95%) in females. Of interest, the case-fatality rate for cases with known outcome is significantly higher for males than for females (10 of 113 vs. 100 of 2,269, p=.037, Fisher's exact test, 2-tailed). The reason for this difference is unknown.

FIGURE 1. Distribution of cases* of toxic-shock syndrome reported through April 16, 1984, United States

FIGURE 2. Cases of toxic-shock syndrome, United States, 1960-1984*



* Reported as of April 16, 1984.

The overwhelming majority (97%) of reported cases have been in whites, although whites constitute only 80%-85% of the U.S. population. It has been postulated that difficulty in recognizing the rash on dark-skinned individuals, poorer access of minority races to medical care, and the relative paucity of these races in areas with active TSS research efforts have all contributed to the observed racial distribution of cases. It has also been suggested that there may be differences in susceptibility to TSS among the races. It is worth noting, however, that the racial distribution of the nonmenstrual TSS cases more closely reflects the racial distribution of the U.S. population than does the racial distribution of the menstrual cases, suggesting that other factors, such as documented differences in usage patterns of menstrual-products, may also play a role.

TSS cases in newborn infants and in persons over 80 years of age have been reported. However, a disproportionate number of the reported cases have occurred among those 15 to 34 years of age, including approximately 85% of menstrual cases. Cases of TSS seem to be more common in younger women than in older women within this age group—almost 60% of the menstrual cases have been in women 15 to 24 years of age, compared with approximately 25% in women 25 to 34 years of age. This finding remains unexplained. Furthermore, a similar, but less striking age distribution has been seen in the nonmenstrual cases in females and in males. For example, almost 40% of the male cases have been in men 15 to 24 years of age.

Of the 2,295 cases in women in which the patient's menstrual status was known, 89% were associated with menstruation. This figure does not include a small number of cases in which the patient had onset of illness during menstruation but had a focal source of infection outside the vagina. Of the 1,716 menstrual cases in which the menstrual-product was known, 1,696 (99%) involved the use of tampons, 19 were in users of napkins or minipads only, and one was in a user of sea sponges.

The proportion of reported cases not associated with menstruation has increased steadily since 1980. While only 7% of the cases with onset in 1980 were not associated with menstruation, 16%, 22%, and 29% of the cases with onset in 1981, 1982, and 1983, respectively, were not associated with menstruation. This change has been due primarily to a decrease in the number of menstrual cases being reported, not to an increase in the number of nonmenstrual cases.

While most of the reported cases of TSS have been associated with vaginal *Staphylococcus aureus* infections in menstruating women, cases of TSS unassociated with menstruation have occurred in a variety of clinical settings. In postpartum women, TSS has been reported in association with *S. aureus* vaginal infections, cesarean-section wound infections, and mastitis. It also has occurred in association with *S. aureus* surgical wound infections after surgery at virtually every body site. Of particular interest, however, have been the cases associated with nasal surgery and subsequent use of nasal packing and/or "nasal tampons." TSS has been associated with cutaneous and subcutaneous *S. aureus* infections, such as abscesses, furuncles, hydradenitis, and infected burns, abrasions, and insect bites. Also, TSS has been noted in association with *S. aureus* infections at diverse other body sites (e.g. septic arthritis, bursitis, empyema, osteomyelitis, prostatitis), in patients with "primary bacteremia," and in patients with no apparent source of infection.

Discussion

During the 4 years since CDC began collecting information on the epidemiology of TSS, several potentially important changes in the distribution and characteristics of reported cases have been noted. Not only has the incidence of reported cases changed over time, but the

case-fatality ratio has fallen and the proportion of cases associated with menstruation has decreased. Data from some states with active surveillance for TSS (where artifacts due to changes in reporting should be minimal) show temporal trends similar to those seen in passively collected national data, while data from at least one state with active surveillance show different trends. The extent to which these trends reflect true changes in the epidemiology of TSS, as opposed to changes in diagnosis and reporting, however, is unknown at present.

Hospital-based record review studies in which diagnostic and reporting bias have been eliminated are in progress in several parts of the United States. The results of these studies should help in interpretation of the data collected through passive surveillance. For the moment, it is important that health care providers, public health officials, and the general public be aware that TSS continues to occur, and that it does so in a wide array of clinical settings. CDC would like to continue to receive reports on all suspected cases of TSS.

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